having perforated a cocoon. Shell ratio is minimum in *Actias selene* and maximum in *Samia ricini*, the domesticated eri silk cocoon. The length of a single cocoon filament was maximum in the cultivated *Antheraea assamensis* and minimum in *Actias selene*; however, denier is minimum in *Antheraea assamensis*.

ACKNOWLEDGEMENTS

Financial assistance by the G.B. Pant Institute of Himalayan Environment & Development, Almora, under the research project Biodiversity, Ecology and Conservation of wild silk moths in Nagaland is gratefully acknowledged.

REFERENCES

Arora, G.S. & I.J. Gupta (1979): Taxonomic studies of some of the Indian non-mulberry silkmoths (Lepidoptera: Saturniidae). *Memoirs Zool. Surv. India 16*: 1-163.

Bhattacharya, A., B.K. Singh & P.K. Das (2004): Biodiversity of wild silk moths in Assam (North East India). *Ann. For. 12 (2)*: 208-216.

Chinnaswamy, K.P. (2001): Sericulture biodiversity in India. Pp. 54-61. *In*: Balla, M.K., S. Rayamajhi & N.M.B. Pradhan (Eds): Participatory Biodiversity conservation in South Asia Region FONAREM, Kathmandu, Nepal.

Nassig, W.A., R.E.J. Lampe & S. Kager (1996): The Saturniidae of Sumatra (Lepidoptera). *Heterocera Sumatrana 10*: 3-110.

Peigler, R.S. (1996): Catalog of parasitoids of Saturniidae of the world. *The Journal of Research on the Lepidoptera 33*: 1-21.

Peigler, R.S. & S. Naumann (2003): A revision of the Silkmoth Genus *Samia*. University of Incarnate Word, San Antonio, Texas. Pp. 1-230.

Singh, K.C. & N. Suryanarayana (2005): Wild silk moth wealth of India. Pp. 419-421. *In*: Dandin, S.B., V.P. Mishra Gupta & Y.S. Reddy (Eds): Advances in Tropical Sericulture. Central Sericultural Research & Training Institute, Mysore.

Singh, K.C. & R. Chakravorty (2006): Seri-biodiversity of North-Eastern India – an update. Pp. 8-19. *In*: Handique, J.P. & M.C. Kalita (Eds): Biodiversity Conservation and Future Concern. Gauhati University, Guwahati.

Srivastava, P.K. & K. Thangavelu (2005): Sericulture and Seri Biodiversity. Associated Publishing Company, New Delhi. Pp.1-254.

Thangavelu, K. (1991): Wild sericigenous insects of India: A need for conservation. Wild silkmoths. pp. 71-77.

Thangavelu, K., A.K. Bhagowati & A.K. Chakraborty (1987): Studies on some wild sericigenous insects of North Eastern India. *Sericologia 27(1)*: 91-98.

Thangavelu, K. & A. Borah (1986): Occurrence of *Antheraea mylitta* Drury (Lepidoptera: Saturniidae) in North-eastern India: distributional significance. *Curr. Sci. 55(18)*: 940.

Thangavelu, K., K.V.S. Rao & V.K. Pandey (2002): Wild silk moths biodiversity and conservation. *International Journal of Wild silk moths and silk 7*: 89-93.

13. FIRST RECORD OF THE COLOUR SERGEANT *ATHYMA NEFTE* IN PHANSAD WILDLIFE SANCTUARY IN RAIGAD DISTRICT, MAHARASHTRA, INDIA

Nikhil Bhopale[1] and Sudeep Athavale[2]

[1]Bombay Natural History Society, Hornbill House, S.B. Singh Road, Mumbai 400 001, Maharashtra, India.
Email: nikhilbhopale23@gmail.com
[2]Shreyash, Jaybharat Naka, Panvel 410 206, Maharashtra, India. Email: sudeepathavale@gmail.com

The Colour Sergeant *Athyma nefte* (Cramer) is distributed in North-east Himalayas from Sikkim to Arunachal Pradesh, from Nepal and Bhutan; and from Bangladesh and Myanmar to Orissa and Andaman Islands (Evans 1932; Wynter-Blyth 1957; Kehimkar 2008).

In southern India, Mr. Rhodes-Morgan collected a single male specimen from the Wynaad district of Kerala (de Nicéville 1886). The Colour Sergeant (*Athyma nefte*) belongs to the Family Nymphalidae and is classified as rare to southern India by de Nicéville (1886).

We saw a Colour Sergeant on November 09, 2007, in Phansad Wildlife Sanctuary, which is about 45 km west to the Western Ghats crestline. It was basking on a small shrub in bright sunlight at around 0900 hours in "Chikhalgaan" area. Evans (1932), Wynter Blyth (1957) and Kehimkar (2008) stated that this butterfly prefers wet and hilly regions of evergreen forests of the Western Ghats. The occurrence of this butterfly in Phansad, the first record of this butterfly from Maharashtra, indicates that this could be the northernmost extension of *c.* 340 km from the known record – a male Colour Sergeant in Goa, in August 2008 (D. Raju, pers. comm.).

The information on the distribution of this butterfly is anecdotal, especially from southern India. Intensive field survey all over the northern Western Ghats is essential to evaluate the distributional range and present status.

ACKNOWLEDGEMENTS

I thank Mr. Isaac Kehimkar, BNHS, for confirming the identification of the butterfly. I thank Dr. Girish Jathar, BNHS, for his comments on the manuscript.

REFERENCES

DE NICÉVILLE, L. (1886): The Butterflies of India, Burmah and Ceylon. Vol. 11. Pp. 179. Calcutta Centre Press.

EVANS, W.H. (1932): The Identification of Indian Butterflies. Pp. 161. Bombay Natural History Society, Mumbai.

KEHIMKAR, I. (2008): The Book of Indian Butterflies. Pp. 372. Bombay Natural History Society, Oxford University Press, Mumbai.

WYNTER-BLYTH, M.A. (1957): Butterflies of Indian Region. Pp. 161. Bombay Natural History Society, Mumbai.

14. BIOLOGY OF THE PALM KING *AMATHUSIA PHIDIPPUS*, AN EXTREMELY RARE AND ENDANGERED BUTTERFLY OF PENINSULAR INDIA

GEORGE MATHEW[1] AND UNNI KRISHNAN PULIKKAL[2]

[1]Division of Forest Protection, Kerala Forest Research Institute, Peechi, Thrissur district, Kerala, India. Email: mathew@kfri.org
[2]The Butterfly Art Foundation, Pady P.O., Codali, Thrissur district, Kerala, India. Email: unnips@gmail.com

Introduction

The Palm King *Amathusia phidippus* Linnaeus is an extremely rare and endangered species of butterfly that is strictly restricted to the southernmost tip of peninsular India, widely known as the Travancore in the State of Kerala (Wynter-Blyth 1957). Occurrence of several races of this species has been reported from Myanmar, Andamans, Java, Bali, Philippine Islands and Borneo (Abrera 1985). In India, Palm King has only been recorded from Travancore, near coconut groves. The species is reported to be locally common in areas where coconut groves are widespread and there appears to be no reason why they are rare at other areas of Kerala where there is substantially good availability of host plants along with comparable levels of temperature and humidity at similar altitudes (Wynter-Blyth 1957). Its rarity, patchy distribution and restricted habitat preferences makes it one of the few Oriental butterflies having a high conservation value (Conservation Value 33 out of 40; Kunte 2008). Recently, a small population of this butterfly was observed on ornamental palms in the Thenmala Ecotourism area in Kollam district, Kerala. The collected eggs in the field were reared on ornamental palms to study their biology. The information generated in this study is presented in this paper.

The collected eggs were reared on a potted ornamental palm *Dypsis lutescens* with sufficient foliage. The plant with the caterpillars was kept in a protected room with adequate aeration, sunlight and humidity to save them from predators and environmental hazards. The various stages were observed, photographed and length of different stages recorded.

Of the seven caterpillars that hatched out, two larvae were found to be dead and one was found missing. The remaining four caterpillars successfully matured, pupated and hatched to healthy adults which were later released in a garden containing several host plants, including the ornamental palm *Dypsis lutescens*.

Life cycle of Palm King

Eggs: The freshly laid eggs are creamy white with a small black spot in the centre and a black circular ring. The eggs are laid in a row. At Thenmala, we observed two rows, the first having 15 eggs and the second 3 eggs (Fig. 1a). Prior to hatching, the colour of the egg changes to black. Eggs hatch in 6 to 7 days.

Larvae: The first instar larvae are cylindrical, measuring 0.6 to 0.8 mm in length. The head is disproportionately large, round, black and shiny. The thoracic and abdominal segments are pale yellowish bearing slender, white hairs (Fig. 1b). The last segment has two black spines that look like tails with no additional hairs on them. The first moulting takes place on the fourth day.

The second instar larvae are pale greenish yellow measuring 0.8 to 1.2 mm in length. The head is black and globular with tiny slender white hairs. The hairs on the upper side of the thoracic segments are stouter than the rest of the body hairs, and are directed towards the head. There are two pairs of diffused whitish lines that run from the dorsum of the first thoracic segment to the last abdominal segment. Three black spots are present on the upper side of the third and fourth abdominal segments; the fifth, sixth and seventh segments have two black spots each. The eighth abdominal segment has a characteristic wide-belly bottle shaped black mark with its neck directed towards the ninth segment, which has an additional black spot (Fig. 1c). The last abdominal segment bears two black spines, which have many small hairs on them. As the larvae mature, the third thoracic segment develops a bright orange fold of skin which gives the caterpillar a peculiar striped appearance. After about five days of heavy eating and growth they undergo the second moulting.

The third instar larvae are morphologically very similar to the previous instar, but are longer (3 to 4 cm) and stouter. They are darker and more greenish than yellowish and had a striped appearance due to the wider body lines (Fig. 1d). The black spots increase in number and size giving a mottled